CECIDOMYIIDAE (DIPTERA) FROM CANADIAN AMBER

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ABSTRACT—Four new genera and 4 new species (**Cretocatocha mcalpinei**, **Cretocordylomia quadriseries**, **Cretowinnertzia angustala**, and **Cretomiastor ferejunctus**) are described from specimens embedded in Canadian amber from the Cretaceous period. The genera are assignable to 4 tribes of the more primitive, extant Cecidomyiidae.

Seventy-five million years ago, cecidomyiids existed that were not conspicuously different from some living today. The four species from Cretaceous amber described below each belong to a different tribe of Lestremiinae or Porricondylinae; they establish a new minimum age for these tribes, which previously were known to be only as old as the Eocene period (Meunier, 1904). Modern members of these tribes are sapromycophagous and of wide geographical distribution.

The venation pattern of the wings and the general appearance of extant cecidomyiids are already well established in these fossils, yet in certain characters, e.g. the setiform antennae of *Cretocatocha mcalpinei* and the simple cubitus of *Cretowinnertzia angustala*, some of the fossils are more specialized than their modern relatives. That these fossils fit so well in the tribal classification of modern forms indicates that the sapromycophagous cecidomyiids appeared long before the latter part of the Cretaceous period, in which the present fossils appeared. Schlee and Dietrich (1970) reported cecidomyiids from Lower Cretaceous amber from Lebanon, but those fossils are as yet undescribed.

The Canadian amber fossils are represented by 16 pieces found on the shores of Cedar Lake, Manitoba, and near Medicine Hat, Alberta. McAlpine and Martin (1969) have discussed the history and collections of Canadian amber. The Alberta specimens are associated with the Foremost Formation, 73 to 74 million years old, and the pieces found along the banks of Cedar Lake, Manitoba, are thought to have been washed down the Saskatoon River from that same Formation. This hypothesis is supported by the fact that one of the species, *Cretomiastor ferejunctus*, described below, was found at both sites. I was able to study the pieces of amber through the courtesy of Dr. J. F. McAlpine of the Biosystematics Research Institute, Agriculture Canada, and Dr. F. M. Carpenter of the Museum of Comparative Zoology in Cambridge, Massachusetts.

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Although many of the specimens are in very good condition for fossils, antennal sensoria, usually critical for generic placement and, in this case, of special interest because of the age of the specimens, are not visible. Non-setal sensoria are colorless and are best seen in modern specimens with a phase-contrast microscope, but these pieces of amber are too large for viewing under a compound microscope and cannot be made smaller without danger of fracturing. The abbreviations CNC and MCZ below stand for Canadian National Collection and Museum of Comparative Zoology respectively.

I am pleased to dedicate this paper in honor of my friend and former colleague, Dr. Alan Stone. Always a model of competence and efficiency, Dr. Stone is assured lasting respect in the field of Diptera taxonomy.

Subfamily Lestremiinae
Tribe Catochini
Cretocatocha Gagné, new genus

Male antenna setiform, with 8 flagellomeres, I and II connate, III–VIII tapering gradually as a unit to bristlelike tip. Only setiform sensoria apparent. Eye bridge present. Palpus 4-segmented. Wing vein R_5 shorter than wing. Claws bowed, simple. Empodia rudimentary.

Type species, *Cretocatocha mcalpinei* Gagné

The wing is similar to *Anocha* spp., but the setiform antennae are unique in the Catochini. In several genera, e.g. *Tritozyga* (which has a much different wing), species have the antennal flagellomeres reduced in number from the primitive 14 to 8, but in those cases, only the last 1–3 flagellomeres are narrowed and pointed.

Cretocatocha mcalpinei Gagné, new species

Male head, wing, and tarsus as in fig. 1–3. Wing: Length, 1.3 mm; membrane without macrotrichia.

Holotype: ♂, near Medicine Hat, collected V-1973, J. F. McAlpine and H. J. Teskey, CAS 593, deposited in CNC, Ottawa.

This species is named in honor of J. F. McAlpine of the Biosystematics Research Institute, Agriculture Canada, in appreciation for his leadership in the study of insects from Canadian amber and for the help he has given me in my studies on Cecidomyiidae.

Tribe Micromyini
Cretocordylomyia Gagné, new genus

Antenna with 12 flagellomeres, those of male with 4 crenulate whorls of long setae, those of female distally with more numerous and shorter setae than basally; non-setal sensoria not apparent. Wing: C extending beyond tip of R_5; R_1 more than twice length Rs; Cu fork forming acute angle. Empodia about as long as claws, broad. Female with 2 large, round, subequal spermathecae.

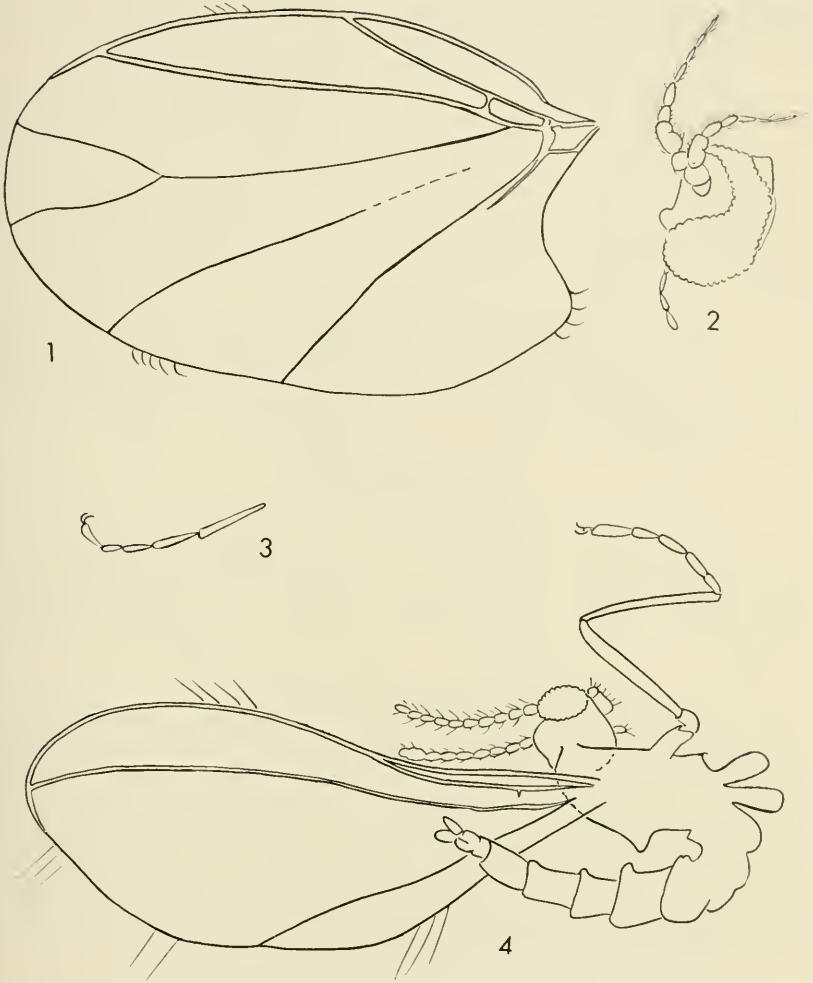

Plate 1

Fig. 1–3, *Cretocatocha mcalpinei* (holotype). 1, wing. 2, head. 3, foretarsus. Fig. 4, *Cretomiastor ferejunctus* (holotype).

Type-species, *Cretocordylomyia quadriseries* Gagné

This genus is close to *Cordylomyia* and *Campylomyza* by reason of the long, broad empodium and long R_1 wing vein. Species of those two modern genera do not have more than $2\frac{1}{2}$ crenulate whorls of long setae on the male flagellomeres. The female flagellomeres of *Cretocordylomyia quadriseries* are similar to those of *Cordylomyia*

spp. Details of antennal sensoria and male genitalia that could further clarify relationships are not apparent or obstructed from view.

Cretocordylomyia quadriseries Gagné, new species

Wing (fig. 5): Length, 1.0 mm in male and female. Antenna: Male flagellomere III as in fig. 6; female flagellomere III as in fig. 7.

Holotype: ♂, Cedar Lake, Manitoba, MCZ #6931, F. M. Carpenter Collection, deposited in MCZ. Paratype: ♂ in same piece of amber as holotype (position relative to holotype marked on vial). Additional specimen: ♀, Cedar Lake, collected VIII-1963, J. E. H. Martin and J. F. McAlpine, CAS 24, deposited in CNC.

The female is tentatively referred here because its wing is similar to that of the male. The name "*quadriseries*" is a noun in apposition meaning "4 rows" in reference to the 4 crenulate whorls of setae on the male flagellomeres.

Subfamily Porricondylinae
Tribe Winnertziini
Cretowinnertzia Gagné, new genus

Female antenna with 10 flagellomeres; non-setal sensoria not apparent. Eye bridge present. Palpus 4-segmented. M_{3+4} wing vein absent. Spermathecae not evident. Claws gently curved, simple. Empodia rudimentary. Ovipositor 3-segmented.

Type-species, *Cretowinnertzia angustala* Gagné

The wing is typical of Winnertziini with Rs placed at approximately a right angle to R_1 and R_5 and with M-rm straight. *Parwinnertzia notmani* Felt is the only other winnertziine without an M_{3+4} vein, but its wing is much narrower than that of *C. angustala* and its palpus is 2-segmented. The 2 species are not necessarily closely related; a wing vein or palpal segment could have been lost on different lines of evolutionary development. Most Winnertziini have characteristic horseshoe-shaped sensoria, but I could not determine their presence on the single specimen of *C. angustala*.

Cretowinnertzia angustala Gagné, new species

Wing length, 1.2 mm. Body outlined in Figs. 8–9.

Holotype: ♀, Cedar Lake, Manitoba, collected VII-1950, Bird and Brown, CAS 25, deposited in CNC.

The name "*angustala*" is a noun in apposition meaning "narrow wing."

Tribe Heteropezini
Cretomiastor Gagné, new genus

Female antenna with 10 flagellomeres, non-setal sensoria not apparent. Eye bridge not evident. Palpus 1-segmented, large. Wing: Broad, with fringe of

Plate 2

Fig. 5–7, *Cretocordylomyia quadriseries* (holotype). 5, wing. 6, ♂ flagellomere III. 7, ♀ flagellomere III. Fig. 8–9, *Cretowinnertzia augustala* (holotype). 8, outline of body. 9, hindtarsomere V.

long setae; membrane without macrotrichia; Cu present, simple. Tarsi 5-segmented, tarsomeres I and II more closely joined than other tarsomeres. Claws long, simple, evenly curved. Empodia short. Abdomen with 2 round spermathecae and 3-segmented cerci.

Type-species, *Cretomiastor ferejunctus* Gagné

Heteropezini have foreshortened tarsi, often of fewer than 5 tarsomeres. *Cretomiastor ferejuncta* has 5 tarsomeres but there is barely a separation between I and II, an indication that the reduction exhibited in the tribe today was begun long ago. Non-setal sensoria are not apparent, but if keyed in Wyatt (1967), the species might run to *Leptosyna* except that the wing of *C. ferejunctus* lacks macrotrichia. Key characters aside, the wing of *C. ferejunctus* is much broader than that of any *Leptosyna*.

Cretomiastor ferejunctus Gagné, new species

Wing length: 0.9–1.1 mm. Female is partially outlined in Fig. 4.

Holotype: ♀, near Medicine Hat, Alberta, collected by J. F. McAlpine, B. Cooper, and D. Daze, CAS 1163c, deposited in CNC. Paratypes (all ♀♀; all except the last item below from near Medicine Hat and deposited in CNC): same data as holotype except CAS 1163b; VII-8-11-1971, J. F. McAlpine, CAS 380 and 425; V-1973, J. F. McAlpine and H. Teskey, CAS 839 and 906; 1973, P. Boston, CAS 781a, 781b, and 1243; and Cedar Lake, Manitoba, MCZ #6937, F. C. Carpenter Collection, deposited in MCZ.

The name "*ferejunctus*" is an adjective meaning "nearly joined" in reference to the almost connate tarsomeres I and II.

References

McAlpine, J. F. and J. E. Martin. 1969. Canadian amber—a paleontological treasure-chest. Can. Entomol. 101:819–838.

Meunier, F. 1904. Monographie des Cecidomyidae, des Sciaridae, des Mycetophilidae et des Chironomidae. Ann. Soc. Sci. Bruxelles. 28:12–275.

Schlee, D. and M. G. Dietrich. 1970. Insektenführender Bernstein aus der Unterkreide des Libanon. Neues Jahrb. Beol. Paläontol. Monatsh. 1970:40–50.

Wyatt, I. J. 1967. Pupal paedogenesis in the Cecidomyiidae (Diptera). 3—A reclassification of the Heteropezini. Trans. Roy. Entomol. Soc. London. 119:71–98.